

REMARKS/ARGUMENTS

I. Status of Claims

Claims 1-28 are pending of which claims 1, 10, 15 and 20 are independent.

II. Rejections under 35 U.S.C. §103 (a)

Claims 1-4, 6-8, and 15-17

Claims 1, 2, 3, 4, 6, 7, 8, 15, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies et al. (U.S. Publication No. 2003/0185249—hereinafter Davies) in view of Hurren et al. (U.S. Patent No. 6,788,681—hereinafter Hurren). Applicants respectfully traverse the rejection.

1. Claim 1

Claim 1 recites a switching control method for controlling traffic flow of an Ethernet frame comprising the steps of:

“receiving an Ethernet frame containing predetermined priority information based on a type of traffic as a class of service (CoS) from a source node;

buffering the received Ethernet frame in a data buffer classified by the CoS;

comparing a size of data currently buffered in the data buffer with a predetermined threshold value;

when the size of data currently buffered in the data buffer is equal to or larger than the threshold value, generating a PAUSE frame containing a value of the CoS; and

transmitting the PAUSE frame to the source node.” (emphasis added).

In the Office Action, the Examiner first asserts that Davies teaches the subject matter of “generating a PAUSE frame containing a value of the priority”. Later, although the Examiner correctly concedes that Davis does not specifically teach “buffering the received Ethernet frame in a data buffer classified by the CoS” and “generating a PAUSE frame containing a value of the CoS”, both of which are recited in claim 1, the Examiner nonetheless turns to Hurren and appears to argue that Hurren cures those deficiencies of Davies in view of the Examiner’s earlier assertion that Davies teaches the subject matter of “generating a PAUSE frame containing a value of the priority”.

Hence, before addressing whether Hurren cures those admitted deficiencies of Davies, it is believed to be beneficial to first discuss whether Davies teaches the subject matter of “generating a PAUSE frame containing a value of the priority”, as it is relevant to whether the combination of Davies and Hurren will arrive at the subject matter recited in claim 1.

A. The Examiner errs in concluding that Davies teaches the subject matter of “generating a PAUSE frame containing a value of the priority”

On page 4 of the Office Action, the Examiner asserts that Davis teaches the subject matter of “generating a PAUSE frame containing a value of the priority”, citing Fig. 2 and paragraphs [0003], [0010], [0031-0032], [0036], [0055] and [0057] of Davies. In particular, in supporting the assertion, the Examiner argues the following:

“according to [0031-0032][0036][0055], the frames with priority information are sent over a single physical link, which is subdivided into eight logical links with respect to the eight priority levels; in such scenario the priority information plays a crucial role in allocating different prioritized frames to the corresponding logical link; similarly, in order to suspend a specified priority of traffic, the PAUSE frame, which conforms to the standard Ethernet frame format with a MAC Control Parameters field specifying a pause time, must

also include a priority information, namely the specified priority of the traffic”.

In essence, the Examiner appears to argue that **“the PAUSE frame, ..., must also include a priority information, namely the specified priority of the traffic”** in order to suspend traffic of a specific priority, based on Examiner’s assessment that Davies teaches that “the frames with priority information are sent over a single physical link, which is subdivided into eight logical links with respect to the eight priority levels” and that “in such a scenario, the priority information plays a crucial role in allocating different prioritized frames to the corresponding logical link”. This logic is without merit for the reasons stated below.

The issue is whether Davies teaches “generating a PAUSE frame containing a value of the priority”. The Examiner first states “the frames with priority information are sent over a single physical link, which is subdivided into eight logical links with respect to the eight priority levels.” The Examiner then states that “in such a scenario, the priority information plays a crucial role in allocating different prioritized frames to the corresponding logical link.” However, it is unclear which scenario that “in such a scenario” refers to, since two types of frames are discussed in Davies: one being a data frame and the other being a PAUSE frame. For the sake of argument, Applicants construe “such a scenario” by assuming that the Examiner intends “such a scenario” to cover the following two scenarios:

- 1) where a plurality of eight logic links are aggregated onto a single physical link, and a *data frame* is sent over a single physical link (see paragraph [0036] of Davies).
- 2) where a plurality of eight logic links are aggregated onto a single physical link, and a *PAUSE frame* is sent over a single physical link (see paragraph [0036] of Davies).

With respect to the first scenario, the Examiner's assessment that "the frames with priority information" may only refer to **data frames** disclosed in paragraphs [0031-0032], [0036] and [0055] but not PAUSE frames disclosed in Davies, since nowhere does Davies disclose a PAUSE frame that contains priority information. Thus there is no such thing as "the PAUSE frames with priority information" in accordance with Davies' disclosure.

However, a data frame is not a PAUSE frame, **because a PAUSE frame does not carry substantive data but instead is a frame generated for traffic flow control purposes.** See paragraph [0002] of Davies and Fig. 3 and page 4 of the specification of the present application. Accordingly, the Examiner's reference to "the frames with priority information are sent over a single physical link" has absolutely no bearing on whether Davies teaches a PAUSE frame contains a value of the priority.

Accordingly, the Examiner's argument that Davies teaches "generating a PAUSE frame containing a value of the priority" based on the first scenario is without merit.

Turning to the second scenario, the Examiner's argument that "in such scenario the priority information plays a crucial role in allocating different prioritized frames to the corresponding logical link; similarly, in order to suspend a specified priority of traffic, the PAUSE frame, ..., must also include a priority information, namely the specified priority of the traffic", appears to argue that Davies must have taught the subject matter of "generating a PAUSE frame containing a value of the priority", simply because of the assumption that priority information associated with each PAUSE frame has to be sent over the single physical link in order to suspend traffic of a specific priority. Nonetheless, this argument of the Examiner's is also incorrect.

First, even assuming the Examiner's assumption that the priority information associated with a PAUSE frame has to be sent over the single physical link in order to suspend traffic of a specific priority is correct, which it is clearly not (*as will be shown below*), the Examiner's assessment that Davies must have taught the subject matter of "generating a PAUSE frame containing a value of the priority" is still without merit. Specifically, the alleged fact that the priority information associated with each PAUSE frame has to sent over the single physical link **does not necessarily** lead to the subject matter of "generating a PAUSE frame containing a value of the priority", given that the priority information can be delivered over the single physical link **via a myriad of ways, and certainly does not have to be contained in a PAUSE frame**. In other words, even if the priority information has to be sent over the single physical link for the purpose of allocating different prioritized frames to the corresponding logical link and properly suspending traffic of a specific priority, **the priority information does not necessarily have to be contained in a PAUSE frame in order for the priority information to be successfully delivered.**

Hence, the Examiner's alleged assumption that the priority information associated with a PAUSE frame has to be sent over the single physical link in order to suspend traffic of a specific priority has **no bearing** on whether Davies teaches the subject matter of "generating a PAUSE frame containing a value of the priority". Accordingly, the Examiner's argument that Davies must have taught the subject matter of "generating a **PAUSE frame containing a value of the priority**" based on the alleged assumption is completely erroneous.

Second, the Examiner's assumption that the priority information associated with a PAUSE frame has to be sent over the single physical link in order to suspend traffic of a specific priority under Davies' scheme, which serves as the basis of the Examiner's ultimate argument that Davies must have taught the subject matter of "generating a PAUSE frame containing a value of the priority, is, in fact, erroneous in itself.

Specifically, according to the scheme disclosed in Davies, **each of the eight queues** in the Ethernet Switch/Hub 300 transmits a PAUSE frame has a one-to-one correspondence to one of the corresponding **eight queues** in the Ethernet Tx 100 or Ethernet NIC 100. In the process of transmitting a PAUSE frame, **a multiplexing and de-multiplexing mechanism** involving aggregating the logic links (corresponding to pairs of a transmitting queue and its corresponding receiving queue) into a single physical link, **which is a priority-independent mechanism**, is employed so as to ensure that the PAUSE frame being transmitted from one transmitting queue to its intended corresponding receiving queue. See paragraphs [0036] and [0055]. **As understood by a person of ordinary skill, a multiplexing and de-multiplexing mechanism is priority-independent, or in other words, priority-blind, and thus does not have to carry priority-information. However, each transmitting queue, by itself, corresponds to one of eight possible priority values, so does each receiving queue, given that the eight transmitting queues and eight receiving queues have a one-to-one correspondence relationship.**

Hence, as long as a receiving queue is ensured to receive a PAUSE frame transmitted from its corresponding transmitting queue as a result of the **priority-blind multiplexing and de-multiplexing mechanism** employed in the transmission process, the receiving queue knows full well which priority information the received PAUSE frame is associated with, **without any need to receive any priority information sent over the single physical link, given that the receiving queue itself corresponds to one of eight possible priority values**. In other words, a receiving queue itself is associated with a priority value, and thus **automatically** identifies the priority value associated with an incoming PAUSE frame, which, to be exact, is the priority value that the receiving queue is associated with.

Accordingly, contrary to the Examiner's assumption that **the priority information associated with a PAUSE frame has to be sent over the single physical link in order to suspend traffic of a specific priority**, **there is absolutely no need for Davies' scheme to send the priority information over the single physical link in**

order to suspend a traffic of a specific priority, given that the multiplexing and de-multiplexing mechanism employed in the process involving aggregating the logic links into a single physical ensures that the PAUSE frame being transmitted from a transmitting queue to the intended corresponding receiving queue. Accordingly, the Examiner errs in assuming that the priority information associated with a PAUSE frame has to be sent over the single physical link in order to suspend traffic of a specific priority under Davies' scheme.

In sum, with respect to the second scenario, even assuming that the Examiner's assumption that the priority information associated with a PAUSE frame has to be sent over the single physical link in order to suspend traffic of a specific priority is correct, which it clearly is incorrect as demonstrated above, the Examiner's argument that Davies must have taught the subject matter of "generating a PAUSE frame containing a value of the priority" is still without merit. On the other hand, because each queue disclosed in Davies, by itself, corresponds to one of eight possible priority values, there is absolutely no need for Davies' scheme to place the priority information in a PAUSE frame sent over a single physical link in order to identify priority information associated with the PAUSE frame and subsequently suspend a specific priority of traffic.

Accordingly, with respect to the second scenario, contrary to the Examiner's arguments, Davies does not disclose, teach, or suggest "generating a PAUSE frame containing a value of the priority."

On the other hand, a straight reading of Davies clearly shows that, contrary to the Examiner's conclusion, nowhere does Davies disclose, teach, or suggest of "generating a **PAUSE frame** containing a value of the priority". In fact, it appears that Davies' teaching with respect to the PAUSE frame is **nothing different from** the conventional PAUSE frame, which uses time-out value to inform a source node to stop transmission of data frames, and does not include the priority information (see Fig. 3 and page 5 of the specification of the present application). This is because

throughout Davies where PAUSE frame is discussed, only the time-out value associated with an intended suspension of transmission of data or its purported function of suspending transmission is substantively discussed. See paragraphs [0002-0006], [0010], [0019], [0035], [0044] and [0052-0055] of Davies.

From a different perspective, given that, as discussed above, Davies' scheme is so designed that there is absolutely no need to send the priority information over the single physical link in order to suspend traffic of a specific priority, Davies' scheme can only be viewed as teaching away from "generating a PAUSE frame containing a value of the priority."

Accordingly, the Examiner's arguments advanced on page 4 of the Office Action that Davies must have taught "generating a PAUSE frame containing a value of the priority" is without merit, and contrary to the Examiner's conclusion, Davies teaches away from "generating a PAUSE frame containing a value of the priority."

B. Hurren fails to cure the deficiencies of Davies

As discussed above, in the Office Action, the Examiner correctly concedes that Davis does not specifically teach "buffering the received Ethernet frame in a data buffer classified by the CoS" and "generating a PAUSE frame containing a value of the CoS", both of which are recited in claim 1. Nonetheless, the Examiner turns to Hurren as curing those deficiencies of Davies. Applicants respectfully disagree with the Examiner's assessment with regard to Hurren.

As a secondary reference, Hurren is not even related to a switching control method or apparatus for controlling traffic flow of an Ethernet frame, as related to the subject matter of claim 1. Rather, Hurren is directed to a scheme that provides VPN to be provisioned over a connectionless network, as opposed to a conventional connection-oriented network. In particular, Hurren is merely referenced for some teaching of CoS.

Specifically, the Examiner relies on Figs. 4 and 5, col. 12, lines 21-36, col. 13:59 – col. 14:9 and col. 14, lines 55-62 of Hurren as curing the correctly admitted deficiencies of Davies. However, Figs. 4 and 5, and col. 12, lines 21-37 of Hurren, merely disclose that CoS information can be included in an IPT header; col. 13:59 - col. 14:9 of Hurren merely discloses that a User-Network Interface (UNI) port may map a three-bit user priority indicator of IEEE 802.1Q (which appears to correspond to the three-bit priority value disclosed in both Davies and the specification of the present application) to a CoS for managing traffic in a network by group similar types of traffic together; and col. 14, lines 55-62 of Hurren merely teaches that the CoS field of the IPT header can be populated based on data retrieved from the IPT card's stored mapping frame or packet attributes to the CoS field.

None of Hurren's above-detailed disclosure concerning CoS, however, is relevant to either "buffering the received Ethernet frame in a data buffer classified by the CoS" or "generating a PAUSE frame containing a value of the CoS", both of which is recited in claim 1. Accordingly, Hurren is well short of curing the deficiencies of Davies.

Nonetheless, on page 5 of the Office Action, the Examiner appears to argue that incorporating Davies' flow control method with Hurren's VLAN operation, and particularly, implementing Davies' prioritized traffic control with IPT header encapsulation "to control the traffic flow between two Ethernet devices across a single link, a network or any type of connection in between", will arrive at the subject matter recited in claim 1. Applicants respectfully disagree.

First, with respect to Davies' deficiency concerning "generating a PAUSE frame containing a value of the CoS", as discussed above, Davies does not even disclose, teach, or suggest "generating a PAUSE frame containing a **value of the priority**". In fact, as analyzed above, Davies teaches away from "generating a PAUSE frame containing a **value of the priority**", due to its intentional design.

Hence, a person of ordinary skill, even having the knowledge regarding CoS taught in Hurren, will have no reason whatsoever to arrive at “generating a PAUSE frame containing a **value of the CoS**”.

Further, IPT header, as disclosed in Hurren, is not designed for controlling traffic flow of an Ethernet frame, as related to the subject matter of “generating a PAUSE frame containing a **value of the CoS**”. Rather, IPT header, according to Hurren, is designed for providing VPN to be provisioned over a connectionless network. Hence, IPT header’s inclusion of a CoS field has no bearing on “generating a **PAUSE frame containing a value of the CoS**”, and thus will not prompt a person of ordinary skill to combine Davies in such a manner that will arrive at the claimed subject matter of “generating a **PAUSE frame containing a value of the CoS**”, given that Davies even **teaches away from** “generating a PAUSE frame containing a value of the priority”.

Accordingly, the Examiner’s suggestion with regard to “implementing Davies’ prioritized traffic control with IPT header encapsulation” simply cannot produce the claimed subject matter of “generating a PAUSE frame containing a **value of the CoS**”.

Second, with respect to Davies’ deficiency concerning “buffering the received Ethernet frame in a data buffer classified by the CoS”, Hurren, at best, generally discloses information concerning CoS as applicable to managing traffic in a network, such as “grouping similar types of traffic together”. Hurren, however, is well short of teaching anything remotely relevant to “buffering the received Ethernet frame in a data buffer classified by the CoS”, as recited in claim 1, which specifically relates to controlling traffic flow of an Ethernet frame.

In addition, according to Hurren, CoS, in fact, is **well known in the art**, at the time of Hurren’s application, **which is more than two years earlier than Davies’ application** when judged by their respective filing date. Hence, CoS is well known at

the time of Davies' invention. Yet, Davies teaches buffering the received Ethernet frame in a data buffer classified by a priority class, rather than teaches buffering the received Ethernet frame in a data buffer classified by the CoS, even though CoS is readily available in the art at the time of Davies' invention. Consequently, Davies' scheme of buffering the received Ethernet frame in a data buffer classified by a priority class can only be viewed as **teaching away from** "buffering the received Ethernet frame in a data buffer classified by the CoS", as recited in claim 1.

With Davies teaching away from "buffering the received Ethernet frame in a data buffer classified by the CoS", and Hurren merely disclose some general knowledge concerning CoS as applicable to managing traffic in a network that has little relevant to the subject matter, the combination of Davies and Hurren simply will not arrive at "buffering the received Ethernet frame in a data buffer classified by the CoS", as recited in claim 1.

Accordingly, contrary to the Examiner's assessment, Hurren does not cure the correctly conceded deficiencies of Davies with respect to "buffering the received Ethernet frame in a data buffer classified by the CoS" and "generating a PAUSE frame containing a value of the CoS".

C. Summary

In summary, the Examiner's argument that Davies must have taught "generating a PAUSE frame containing a value of the priority" is meritless. In fact, as analyzed above, Davies **teaches away from** "generating a PAUSE frame containing a value of the priority".

Given that Davies teaches away from "generating a PAUSE frame containing a value of the priority", contrary to the Examiner's assessment, Hurren does not cure the deficiency of Davies with respect to "generating a PAUSE frame containing a value of the CoS". In addition, since Davies teaches away from "buffering the received

Ethernet frame in a data buffer classified by the CoS”, Hurren also does not cure this deficiency of Davies. Accordingly, claim 1 should be allowable over Davies and Hurren, and the rejection of claim 1 should therefore be withdrawn.

2. Claims 2-4, 6-8, and 15-17

Claim 15 contains subject matter akin to the subject matter of “buffering the received Ethernet frame in a data buffer classified by the CoS”, as recited in claim 1, and the subject matter of “generating a PAUSE frame containing a value of the CoS”, as recited in claim 1. Accordingly, for at least the same reasons stated above in connection of claim 1, claim 15 should also be allowable over Davies and Hurren, and the rejection of claim 15 should therefore be withdrawn.

The rejection of claims 2-4, 6-8 and 16-17 should be withdrawn by virtue of their dependency from allowable claims 1 and 15 respectively.

Claims 5, 9-14, 18-28

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davies in view of Hurren as applied to claim 1, and further in view of Chen et al. (U.S. Publication No. 2003/0147347—hereinafter Chen).

Claims 10, 11, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies in view of Hurren, in further view of Lin (U.S. Patent No. 6,754,179—hereinafter Lin), and still further view of Pope et al. (GB Patent Application No. 2372679—hereinafter Pope)

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davies in view of Hurren, in further view of Lin, and still further view of Pope, and still further view of Chen.

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies in view of Hurren as applied to claim 15, and in further view of Lin.

Claims 20, 21, 22, 25, 26, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies in view of Hurren, in further view of Chen.

Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies in view of Hurren, in further view of Chen as applied to claim 20, and still further view of Lin.

Applicants respectfully traverse the rejections.

Claims 10 and 20 both contain subject matter akin to “buffering the received Ethernet frame in a data buffer classified by the CoS”, and “generating a PAUSE frame containing a value of the CoS”, both of which are recited in claim 1. Accordingly, for at least the same reasons stated above in connection with the rejection of claim 1, Davies and Hurren, taken either singly or in combination, do not disclose, teach, or suggest the subject matter recited in claims 10 and 20 akin to the above-quoted subject matter. The cited secondary references, Lin and Chen, however, do not cure the deficiencies of Davies and Hurren discussed above. Accordingly, claims 10 and 20 should be allowable over Davies, Hurren, Lin and Chen. The rejection of claims 10 and 20 should be withdrawn.

Claims 5, 9, 11-14, 18-19 and 21-28 depend from independent claims 1, 10, 15 and 20 respectively, and thus inherit all the limitations from their respective independent claims. Since the cited secondary references, Lin, Pope and Chen, do not cure the deficiencies of Davies and Hurren discussed above in connection with the independent claims, claims 5, 9, 11-14, 18-19 and 21-28 are allowable by virtue of their dependency from the independent claims. The rejection of claims 5, 9, 11-14, 18-19 and 21-28 should therefore be withdrawn.

III. Conclusion

In view of the above, it is believed that this application is in condition for allowance and notice to this effect is respectfully requested. Should the Examiner have any questions, the Examiner is invited to contact the undersigned at the telephone number indicated below.

Should any/additional fees be required, the Director is hereby authorized to charge the fees to Deposit Account No. 18-2220.

Respectfully submitted,



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